

nut-brown within, at least in large part, not quite circular, being a little longer than wide, and with the inner margin less arcuate than the outer. Peristome moderately broad, with a low, brown, raised inner rim, and whitish or white expansion, which is dilated into a slightly recurved or concave lobe above, adnate to the preceding whorl; it is also a little dilated at the columellar margin. The umbilicus is smooth within, but rarely shows faint traces of a few spiral cords.

Length 17, diam. 13 mm.

Length 15, diam. 11 mm.

The operculum is white externally, slightly concave, rather coarsely wrinkled tangentially, and with about $2\frac{1}{2}$ whorls after the blackish nucleus, which is situated at about the lower third, and much nearer the columellar than the outer margin. The edge is very deeply grooved, the sides of the groove smooth or nearly so.

Braco, Trelawny, in northwestern Jamaica, the types collected by Mr. George Nutt, and sent by Mr. P. W. Jarvis.

This species differs from *C. chevalieri* in the sculpture of fine vertical striæ, the obsolescence of spiral cords around the umbilicus and in coloration. *C. albus*, which has similar sculpture and operculum, differs in the narrow lip, not dilated above. The latter species is the most nearly related form known to me.

Sometimes the wide median color zone is split by a lighter peripheral tract; or it may be reduced to a narrower belt below the periphery.

NOTES ON THE MOLLUSK FAUNA OF SAN NICHOLAS ISLAND.

BY HERBERT N. LOWE.

San Nicholas, the most bleak and barren bit of land in the whole group of the Santa Barbara Islands, lies apart from its more favored sister islands, sixty-five miles from the mainland. It is a small island, barely nine miles long, by four or five wide, without a vestige of a tree of any kind, and very little of the cactus, which grows in such quantities on the other islands. About half its area is a great desert of shifting sands where lie the bleaching bones of an extinct race of Indians which inhabited the island many years ago. Many

strange and interesting implements of stone, bone and shell have been found, showing very skillfull workmanship.

On this favored spot it was the writer's good fortune to spend three weeks in scientific research during the month of February, 1902. The marine shells are all of rare occurrence, with the exception of *Acmæa gigantea*, *Haliotis cracherodii* and *Mytilus californianus*, which grow on the rocks by the thousand. The red "abalone," *Haliotis rufescens*, used to be very abundant on the island, as was also the giant *Cryptochiton stelleri*, but are now of very rare occurrence. The smaller species, such as *Ocenebra circumtexta*, *Marginella varia*, *Gadinia reticulata*, *Mitromorpha filosa*, *Megatebennus bimaculatus* and a few of the smaller *chitons* were found under stones in little sheltered inlets away from the heavy surf.

The remainder of the coast line is composed alternately of great ledges of smooth rocks and strips of smoother sand beach. Unlike the other islands, with their steep cliffs jutting off abruptly into deep water, San Nicholas is low, lying with bluffs sloping gradually to the water's edge, with shallow water a long distance from shore. A belt of kelp, in places more than a mile wide, surrounds the island, making a landing very difficult. A fair idea of the marine species inhabiting the coast may be obtained from the bleached shells found on the old Indian camp grounds, as they seemed to have eaten molluscs of every description, principally the *Haliotis*, fragments of which cover the mounds by the million, and the iridescent shells reflecting the rays of the sun in a gorgeous and dazzling play of color, present a picture long to be remembered.

The following is a list of marine species found on the Indian mounds:

<i>Cypræa spadicea</i> Gray.	<i>Cryptochiton stelleri</i> Midd.
<i>Trivia solandri</i> Gray.	<i>Cardium quadrigenarium</i> Con.
<i>Krato vitelina</i> Hds.	<i>Cardium biangulatum</i> Sby.
<i>Acmæa gigantea</i> Gray.	<i>Rupellaria lamellifera</i> Con.
<i>Acmæa mitra</i> Esch.	<i>Lucina californica</i> Con.
<i>Acmæa pelta</i> var. <i>nacelloides</i> Dall.	<i>Venus fordii</i> Yates.
<i>Chlorostoma brunneum</i> Phil.	<i>Hinnites giganteus</i> Gray.
<i>Chlorostoma montereyensis</i> Kien.	<i>Pecten æquisulatus</i> Cpr.
<i>Chlorostoma funebre</i> A. Ad.	<i>Tapes staminea</i> Con.
<i>Gadinia reticulata</i> Cpr.	<i>Norrissia norrissii</i> Sby.

<i>Lucapina crenulata</i> Sby.	<i>Monoceros lapilloides</i> Com.
<i>Fissuridea aspera</i> Esch.	<i>Olivella boetica</i> Cpr.
<i>Pachypoma inequale</i> Martyn.	<i>Oliva biplicata</i> Sby.
<i>Pomaulax undosus</i> Wood.	<i>Purpura saricola</i> Val.
<i>Ocinebra circumtexta</i> Stearns.	<i>Mytilus californianus</i> Con.
<i>Fusus barborensis</i> Trask.	<i>Haliotis rufescens</i> Swain.
<i>Mitra maura</i> Swains.	<i>Haliotis cracherodii</i> Leach.
<i>Cancellaria cooperi</i> Gabb.	<i>Haliotis corrugata</i> Gray.
<i>Ischnochiton conspicuus</i> Cpr.	<i>Natica</i> sp.

The reefs where the *Acmæa gigantea* have their home, jutting out between the sand beaches, are, after every storm, temporarily covered over with sand. At such times a large quantity of sand gets under the mantle of the *Acmæa*, causing little nodules to be formed on the inside of the shell, from the size of a pinhead to that of a small bean. The shells were of unusual thickness, to withstand the continual pounding of the surf.

As I have previously stated, the island is almost destitute of vegetation, making the land shells few and far between. The only species were: *Helix tryoni*, found alive in small numbers; *H. feralis*, one fresh specimen and occasional dead ones; *H. sodalis*, none but dead and bleached ones. I should probably not have obtained any live *Helices* had it not been for a rain storm which came on while I was on the island, when the tiny creatures seemed to sprout as it were from the bowels of the earth. After every rain storm there comes a fierce, drying, west wind, which makes the snails "hunt their holes" in a hurry, and any unfortunate *Helix* not under cover is made short work of by the scorching winds and sand blowing upon them. About the only food for the snails is a low-growing salt bush, at the roots of which they burrow in the dry season. At the east end of the island are found the few scattering live *Helices* with comparatively few dead shells, while at the west end of the island the dead and bleached shells lie by the thousand on the great stretches of shifting white sand. As there is no vegetation whatever at that end of the island, and the prevailing winds, in the opposite direction, makes it impossible for them to have been driven there by that agency, it remains an unanswered question how came these myriads of dead and bleached shells in this sand desert?

At the west end occasional springs of fresh water drip from over-

hanging ledges of rock to little pools on the sand beach, and then flow to the great ocean without having benefited the island in any way. In these little pools a few small stunted *Physas* were found.

During the winter season the island is the rendezvous of Japanese fishermen, who catch lobsters for the Los Angeles market. They also make a business of hunting *abalones* at low tide. The meats are cleaned from the shells, boiled in salt water and spread on the flat rocks to dry, when they are sacked up and shipped to Japan and China, and considered a great delicacy by the celestial epicures. The shells are sent to Los Angeles and made into pearl buttons, souvenir spoons and various "curios" to tempt the pocket-book of the tourist.

NEW JAPANESE MARINE MOLLUSKS.

BY HENRY A. PILSBRY.

Phasianella tristis n. sp.

Shell imperforate, globose turbinate, thick and solid, dark reddish-brown, the apical whorl whitish; smooth. Spire short. Whorls 3, rapidly increasing, the last rounded. Aperture more than half the length of the shell, oblique, rounded-ovate; columellar margin regularly concave, flattened and callous. Alt. 3.6, diam. 3 mm.

Rishiri, Kitami. Types no. 85222 A. N. S. P., from no. 1367 of Mr. Hirase's collection.

Near *P. oligomphala*, but the aperture is less oblique, the shell more solid and of a more sombre color.

Gibbula affinis var. *cognata* n. v.

Differs from *G. affinis* of the Viti Is. in having the larger spiral cords more equal and regularly spaced, the apical whorls rose-colored. Riukiu I.

Gibbula vittata n. sp.

Shell narrowly but openly umbilicate, conic, fleshy-brown, striped longitudinally with white, the white stripes about half as wide as the darker ones. Surface nearly lusterless. Whorls subangular above